

### **In the Claims**

1. (Currently amended) A method for encoding a video sequence comprising ~~the steps of:~~  
    executing a first phase of motion estimation, ~~the first phase to determine~~ a set of field motion vectors describing a relationship between fields of same polarity in two frames; and  
    ~~using the results of the first phase of motion estimation to execute~~ a scene change detection using the set of field motion vectors; and  
    ~~executing a 3:2 pulldown detection using the set of field motion vectors if no scene change is detected; and~~  
    executing a second phase of motion estimation to determine a set of motion vectors describing a relationship between fields of opposite polarity in the two frames and a relationship between the two frames.
2. (Currently amended) The method of claim 1, wherein:  
    ~~the set of field motion vectors is determined between a first frame and a second frame;~~  
    ~~the first frame having a first field and a second field, the second frame having a first field and a second field; and~~  
    the set of field motion vectors comprises a first set of motion vectors between ~~the a first field of the a first frame and the a first field of the a second frame,~~ and a second set of motion vectors between ~~the a second field of the first frame and the a second field of the second frame.~~
3. (Cancelled)
4. (Currently amended) The method of claim 32, wherein ~~executing the second phase of motion estimation further comprises determining~~ the set of motion vectors comprises:  
    a third set of motion vectors between the first field of the first frame and the second field of the second frame;

a fourth set of motion vectors between the second field of the first frame and the first field of the second frame; and

a fifth set of motion vectors between the first frame and the second frame.

5. (Currently amended) The method of claim 1, further comprising:

~~executing a 3:2 pulldown detection;~~

if the 3:2 pulldown detection detects a repeated field, removing the repeated field.

6. (Currently amended) A video encoder comprising:

a motion detection component having a first phase and a second phase, the first phase to determine ~~a~~ first and second set of motion vectors describing a relationship between fields of same polarity in two frames, and the second phase to determine third and fourth sets of motion vectors describing a relationship between fields of opposite polarity in the two frames, and to determine a fifth set of motion vectors describing a relationship between the two frames;

a scene change detection component to detect a scene change using the first and second set of motion vectors; and

a 3:2 pulldown detection component to detect a repeated field using the first and second set of motion vectors if no scene change is detected;

~~wherein the motion vectors determined by the first phase are used to execute the scene change detection component and the 3:2 pulldown detection component.~~

7. (Cancelled)

8. (Currently amended) The video encoder of claim 6, wherein the first set of motion vectors ~~is determined~~ comprises motion vectors between a first field of a first frame and a first field of a second frame, and the second set of motion vectors ~~is determined~~ comprises motion vectors between a second field of the first frame and a second field of the second frame.

9. (Original) The video encoder of claim 6, wherein the scene change detection component detects a scene change by comparing a ratio of the first and second motion vectors to a threshold.

10. (Original) The video encoder of claim 6, wherein the 3:2 pulldown detection component detects a repeated field by comparing a ratio of the first and second motion vectors to a threshold.

11. (Original) The video encoder of claim 10 further comprising a 3:2 pulldown undo component to compensate for finding a repeated field.

12. (Original) The video encoder of claim 11, wherein the 3:2 pulldown undo component compensates for finding a repeated field by replacing the repeated field with a reference to a field from which the repeated field is repeated.

13. (Currently amended) The video encoder of claim ~~11~~11, wherein the 3:2 pulldown undo component compensates for finding a repeated field by averaging the repeated field and a field from which the repeated field is repeated.

14. (Original) The video encoder of claim 6, wherein the encoder is embodied in a processor.

15. (Currently amended) A computer readable medium storing executable computer program instructions which, when executed by a processor, cause the processor to perform a method comprising:

executing a first phase of motion estimation, the first phase determining a set of field motion vectors describing a relationship between fields of same polarity in two frames; and

~~using the results of the first phase of motion estimation to execute~~ing a scene change detection using the set of field motion vectors; and

executing a 3:2 pulldown detection using the set of field motion vectors if no scene change is detected; and

executing a second phase of motion estimation to determine a set of motion vectors describing a relationship between fields of opposite polarity in the two frames and a relationship between the two frames.

16. (Cancelled)

17. (Currently amended) The computer medium of claim 15, wherein:

~~the set of field motion vectors is determined between a first frame and a second frame;~~

~~the first frame having a first field and a second field, the second frame having a first field and a second field; and~~

the set of field motion vectors comprises a first set of motion vectors between the a first field of the a first frame and the a first field of the a second frame and a second set of motion vectors between the a second field of the first frame and the a second field of the second frame.

18. (Currently amended) The computer readable medium of claim ~~16~~15, wherein the set of motion vectors comprises~~executing the second phase of motion estimation further comprises determining:~~

a third set of motion vectors between the first field of the first frame and the second field of the second frame;

a fourth set of motion vectors between the second field of the first frame and the first field of the second frame; and

a fifth set of motion vectors between the first frame and the second frame.

19. (Currently amended) The computer readable medium of claim 16, further comprising:

~~executing a 3:2 pull-down detection;~~

if the 3:2 pull-down detection detects a repeated field, removing the repeated field.

20. (New) An encoding apparatus comprising:

means for estimating motion comprising first and second phase means, the first phase means for determining a set of field motion vectors describing a relationship between fields of same polarity in two frames and the second phase means for determining a set of motion vectors describing a relationship between fields of opposite polarity in the two frames and a relationship between the two frames;

means to detect a scene change using the set of field motion vectors; and

means to detect a repeated field using the set of field motion vectors if no scene change is detected.